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of Public Health
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September 15, 2003

Mr. William R. Kelly
Project Manager
SEH, Inc.
2637 Midpoint Drive, Suite F
Fort Collins, CO 80525-4415

Dear Mr. Kelly:

Thank you for providing the Draft Sampling and Analysis Plan for Surface Water Quality Monitoring, Rico Colorado, on behalf of Atlantic Richfield Company. The Water Quality Control Division reviewed the draft to ensure future sampling results could be incorporated into the Water Quality Assessment for the Rico-Argentine mine area.

The Division offers the following comments:

General Comments

1. Please include a map that identifies all of the sampling locations, and also provide a detailed narrative description of the actual sampling locations.

Sample Locations

2. As discussed during the site visit, sampling in Silver Creek at a location below the confluence of the Argentine Seep discharge should be included. The best location for this sampling was identified as the point where Silver Creek enters or exits the culvert drain that flows under the unnamed dirt road (this is currently identified as sampling location SVS-8, Silver Creek Below Culvert, in ARCO reports).

3. Additionally, the Argentine Tailings seep sampling collection, which is believed to be located at the point of flow through the 2-inch flume, should also include sampling of the other channel of the seep until such time as these two channels can be combined into one. For the time being, it may be useful to refer to the different channels as Argentine Seep A (nearer to the Argentine Tailings and passing through the 2-inch flume) and Argentine Seep B.

4. The sampling location to represent the upstream water quality above the Argentine Seep represents a perplexing situation. While the Blaine Adit was not found to be discharging at the time of the site visit, Silver Creek in and around the Blaine Adit showed evidence of contamination at locations even 100 yards upstream. This indicates that other sources of mine drainage find their way into Silver Creek and thereby contribute to the pollutants in-stream. To characterize the actual upstream water quality of Silver Creek immediately prior to the Argentine Seep, sampling closer to the location of the Argentine Seep confluence with Silver Creek must be accomplished. ARCO reports have identified a sampling location of SVS-22 (Silver Creek above the Argentine Seep), which appears to be an ideal sampling location. However, sampling at locations far upstream of the Blaine Adit such as at the point of the Town of Rico's water supply diversion (currently identified in ARCO's proposed sampling plan as SVS-1) would not adequately characterize the water quality of Silver Creek immediately upstream of the Argentine Seep. The Division recommends including an additional sampling location at ARCO's SVS-22 location (Silver Creek above the Argentine Seep). The Division would support ARCO also sampling Silver Creek upstream of the Rico Water Supply Diversion, as this information would be extremely useful to the Division in future analyses.

5. Another sampling location discussed with ARCO was the Dolores River immediately upstream of the outfall 002-discharge point from the St. Louis ponds system. This location was suggested as useful in ascertaining the potential migration of St. Louis Pond system water to the Dolores River via groundwater (this is currently identified as sampling location DR-2 in ARCO reports).

6. Based on ARCO's recent suggestions for evaluation of alternative modeling approaches for the Dolores River Basin, the Division believes that additional sampling locations must be added to the proposed sampling plan in order to allow for a complete evaluation of the alternatives. These additional sampling locations include the East Outlet of the Santa Cruz/Rico Boy Wetlands, the West Outlet of the Santa Cruz/Rico Boy Wetlands, and the outlet of the Silver Swan Wetlands. Note that the samples from the East and West Outlets can be combined based on a flow-weighted composite as long as flow rates are determined at both locations.

7. The Division recognizes that the surface overflow via the wetlands' channeled outlet locations do not include the subsurface flows to the Dolores River. Therefore, absent monitoring wells to measure this subsurface drainage, subsurface flow will be assumed to equal, at times of no precipitation events, the inflow to the wetlands from the adits less pan evaporation. To determine wetlands flows to the Dolores River, ARCO must, during each sampling event, determine pan evaporation rates and the pan evaporation factor must be quantified. Through this method of estimation, flow monitoring of all wetland outlets can be avoided (except for purposes of compositing as discussed above). Note that direct precipitation and runoff coefficients for the surrounding basin, which would normally need to be reflected in this evaluation of flows, are assumed to equal zero as long as precipitation does not occur during the

sampling event. Since all parties agree that sampling should reflect low flow conditions, sampling within 24 hours of precipitation should be avoided.

8. The Division also recognizes that the surface outlet locations from the wetlands to the Dolores River do not reflect the pollutant characteristics of the subsurface drainage to the Dolores River. However, absent monitoring wells located within the wetlands, the Division will rely on the water quality concentrations found at the wetland's surface outlet location as representative of subsurface water quality.

9. The Division also has concerns that subsurface migration at various times during the year could be impacting the Dolores River downstream. To determine if there are any downstream impacts, the Division recommends including at least 1 additional downstream sampling location on the Dolores River below the Silver Swan adit discharge. This additional sampling location should be downstream of ARCO's DR-4-SW sampling location (Dolores River below Silver Swan) and at USGS gage #09165000. This additional sampling location should be monitored for the same parameters as the other sampling locations identified in this sampling plan.

Mercury

10. Total mercury needs to be added at all sampling locations and analyses should be performed using the low level analytical methods. There have only been two sampling events (July 2002 and October 2002) using the low level methodology. The July 2002 event showed less than detectable levels. However, mercury was quantifiable at several locations in the October 2002 sampling event. None exceeded the standard. The blank for the October 2002 sampling event contained quantifiable mercury and therefore contamination was suspected by ARCO. A re-analysis was completed and there were still measurable amounts of mercury at some locations, although this re-analysis took place after the sample holding time had expired. In sum, the data does not conclusively prove that mercury is absent. Given the lack of conclusive data, the downstream TMDL for mercury, a general assumption by many that the Rico-Argentine Mine site is the cause of mercury in McPhee Reservoir, and the public interest expressed in Rico concerning mercury, the continuing sampling of mercury is appropriate.

Dissolved Iron

11. Dissolved iron sampling should be conducted in the sampling locations on the Dolores River in order to have data in the event the Dolores River is later classified as a public water supply. Note, however, that most data sets in the Dolores River show existing quality less than the 300 ug/l standard. Thus, this would be useful for determinations of limits in the future should such be necessary.

Dissolved Lead

12. Dissolved lead sampling should be conducted at all sampling locations due to the potential for this pollutant to be of concern. Seasonal water quality data from the April through September season indicate Silver Creek ambient water quality concentrations at the 85th percentile of 1.2 ug/l and the 85th percentile concentration

of effluent quality from the Silver Swan adit was 6.7 ug/l. Additional dissolved lead data will help the Division determine if this parameter is of concern.

Seasonal Sampling

13. ARCO's recommended sampling seasons have been reduced to two. Specifically, ARCO proposes high flow sampling during the months of April through October, and low flow sampling from November through March. The October month belonging in the high flow category is questionable. Thus, the Division recommends that the seasons instead be changed to reflect April through September (high flow) and October through March (low flow).

Sampling Frequency

14. ARCO has indicated in its numerous comments on the Division's water quality assessment that the data used in the assessment are not adequate. However, at ARCO's proposed measurement frequency of twice per year for all pollutants potentially of concern and at all locations that ARCO has indicated should be evaluated, it would take five years to obtain 10 full sets of corresponding data points.

    Much of the currently available data are not appropriate for use in evaluating current conditions because the character of many of the point source discharges have changed as a result of VCUP activities and because changes in analytical methods now allow for quantification of pollutants more accurately and at lower levels. Corresponding sets of data at all locations of interest and for all pollutants potentially of concern would provide the most ideal data and would allow for a greater degree of evaluation and/or discretion. During the 1980's, monthly monitoring was accomplished at multiple locations and therefore this frequency is considered achievable. The Division therefore recommends that ARCO conduct monthly monitoring, with consideration that monitoring events within 24 hours of precipitation events should be avoided.

Sampling Approach

15. EPA commented that ARCO has stated that sampling will be conducted in accordance with the sampling program used for the Rico Site Remediation. EPA has expressed concern over what this means and whether it is adequate. Although ARCO provided the Division with the section covering the results of the sampling conducted as part of the Rico Site Remediation, the entire report was not provided to the Division and therefore no conclusions concerning the sampling program can be made. However, in the interests of moving forward, if the sampling program section of the Rico Site Remediation summary could be forwarded to the Division and EPA, a quick review will be completed, and comments, if any, will be forwarded to ARCO.

Sample Type

16. EPA has expressed concern that sample type (grab vs. composite) and sample collection procedures for chemical analysis are not specified. EPA commented that depth-integrated, cross-sectional composites should be collected from each river location for metals; grab samples at a fully-mixed location should be used for

cyanide, pH, temperature, conductivity, and alkalinity. While EPA and the Division believe that the discharges from seeps and adits would best be characterized using a 24-hour, flow weighted composite, the ability to complete such sampling may be beyond the scope of this effort at this time.

Cadmium

17. EPA has commented that the detection level for cadmium analysis is very close to the water quality standard. Note that the detection level achieved in previous sampling by EPA has been 0.5 ug/l, and the Division's detection level has been 0.3 ug/l. Therefore, the Division suggests that ARCO's sampling achieve a detection level that is approximately an order of magnitude lower than the 3 ug/l proposed in the sampling plan.

Flow Measurement

18. EPA suggests that the sampling plan define the reference to "test cells" for flow measurement using the bucket and stopwatch method. Is this something that is constructed to obtain the flow measurements? The Division therefore suggests that the sampling plan provide some additional explanation on this issue.

Blaine Adit

19. EPA has commented that photos of the Blaine Adit are needed to verify that there is no flow originating from the Blaine Adit. Furthermore, EPA indicates that if there is any discharge occurring at the Blaine Adit, it should be sampled and analyzed and the flow should be measured as well. The Division therefore suggests that the sampling plan be modified to accommodate these concerns.

Metals

20. EPA suggests that all metals of concern used in setting loads and limits should be monitored at all locations. At the present time, post VCUP data at all discharge locations would not enable the Division to perform a quantitative analysis of reasonable potential, specifically in that Division procedures require the use of 10 data points for each parameter. Therefore, if it is ARCO's contention that the quantity and quality of pollutants discharged from each point source has changed since the completion of VCUP activities, sampling for all pollutants with the potential to be pollutants of concern should be completed until a minimum of 10 representative data points have been collected. Note that a qualitative analysis can be conducted using less than 10 data points.

The Division believes that the collection of these additional data may be appropriate if ARCO prefers to have a definitive quantitative reasonable potential analysis conducted. Note that this would necessitate the addition of metals including dissolved selenium, dissolved silver, and total recoverable chromium to the list of pollutants currently being analyzed.

Thank you for your efforts to address the water quality issues in the Rico Area. If you have any questions, please call me at 303-692-3510.

Sincerely,

Susan Robinette

Susan Robinette
Permits Unit Manager
Water Quality Control Division

Cc: Dave Akers, WQCD
Tony Trumbly, Office of the Attorney General
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